

Claims

1. A method for affecting the fan-out effect wherein, for affecting the fan-out effect, initially the image from a sensor (341) is evaluated, which detects the printed image over a scanning width (b341) of at least one-quarter of the web width (b, b') and, in case of a deviation from a preset nominal value, an actuating command is transmitted to an actuating member (338) for affecting the fan-out effect.

2. A method for affecting the fan-out effect by means of a device for affecting the fan-out effect, wherein a sensor arrangement of a lateral registration control/regulation device (342), parts of a lateral registration control/regulation device (342), and/or measured values from a lateral registration control/regulation device (342) are used for triggering a device for affecting the fan-out effect.

3. The method in accordance with claim 2, characterized in that a measured value from the same sensor (341) which records a marker and/or a printed image and or a partial printed image is supplied to a control device (339) of the device (336) for affecting the fan-out effect, as well as to the lateral registration control/regulation device (342).

4. A method for affecting the fan-out effect by means of a device (336) for affecting the fan-out effect, and for

affecting the lateral registration by means of a lateral registration control/regulation device (342), wherein the device (336) for affecting the fan-out effect and the lateral registration control/regulation device (342) make use of a measured value from the same sensor (341).

5. The method in accordance with claim 2 or 4, characterized in that, for detecting the fan-out effect, the measured values from two sensors (341) arranged side-by-side are used, each of which detects in its respective field of view a printed image portion or a marker imprinted on the web (B, B').

6. The method in accordance with claim 2 or 4, characterized in that, for detecting the fan-out effect, the image from a sensor (341) is evaluated, which detects the printed image over a scanning width (b341) of at least one-quarter of the web width (b, b').

7. The method in accordance with claim 1, 5 or 6, characterized in that, for detecting the fan-out, two imprinted markers of a color separation of a defined color are compared in respect to their axial position with a reference position of the two markers.

8. The method in accordance with claim 1, 5 or 6, characterized in that, for detecting the fan-out, image points of two printed image portions of a color separation of a defined color are compared in respect to their axial position with a reference position, in particular a relative

reference position, of the image points of the two printed image portions.

9. The method in accordance with claim 5 or 6, characterized in that, for detecting the lateral registration, the marker of a color separation of a defined color is compared in respect to its axial position with a reference position of the marker.

10. The method in accordance with claim 5 or 6, characterized in that, for detecting the lateral registration, an image point of the printed image portion of the color separation of a defined color is compared in respect to its axial position with a reference position of the image point of the printed image portion.

11. The method in accordance with claim 7 or 9, characterized in that the position of a color or together with a color separation of a color which is different from the first mentioned color is used as the reference position.

12. The method in accordance with claim 11, characterized in that the position of markers which had been imprinted by a printing group (301) through which passage had first occurred is used as the reference position.

13. The method in accordance with claim 8 or 10, characterized in that the position of defined image points, or image areas, of the color separation of this color on a

previously prepared color print-out is used as the reference position.

14. The method in accordance with claim 8 or 10, characterized in that the position of defined image points, or image areas of the color separation of this color from image data of the print pre-stage is used as the reference position.

15. The method in accordance with claim 5, characterized in that the measured value from one of the two sensors (341), in particular from a sensor (341) which is substantially arranged in the area of the web center (M), is used for lateral registration control/regulation (342).

16. The method in accordance with claim 5, characterized in that one of the two measured values, in particular a measured value obtained in the area of the web center (M), is evaluated in respect to a nominal position of the color separation, and the two measured values are evaluated in respect to a distortion or widening of the printed image in comparison with a preset nominal value.

17. The method in accordance with claim 6, characterized in that the recorded color separation, or the recorded color separation portion, is evaluated in respect to an offset of the nominal position in comparison with a reference of this color separation, and individual image points, or image areas, are evaluated in respect to a

distortion or widening of the printed image in comparison with a preset nominal value.

18. The method in accordance with claim 1, 6 or 17, characterized in that, for determining the fan-out, several individual image points, or image areas, of the recorded printed image are evaluated in relation to their lateral spacing from each other in respect to a distortion or widening of the printed image in comparison with a preset nominal value or reference.

19. The method in accordance with claim 18, characterized in that in the course of this the same absolute value of a lateral offset, caused by an lateral registration error, of the respective image point, or image area, is subtracted.

20. The method in accordance with claim 19, characterized in that, if a scanning width (b341) which includes the web center is provided, the amount of lateral offset representing the lateral registration error is detected by the deviation of the image point, or image area, from the nominal position in the area of the web center (M).

21. The method in accordance with claim 19, characterized in that the amount representing the lateral registration error is determined by extrapolating several lateral deviations, measured outside of the web center, of the image points, or image area, from their nominal position

regarding an expected deviation from their nominal position in the area of the web center (M).

22. The method in accordance with one or several of the preceding claims, characterized in that image data measured as nominal allowance, nominal value allowance, or nominal position, of a reference printout are used.

23. The method in accordance with one or several of the preceding claims, characterized in that image data from the printing pre-stage are used as nominal allowance, nominal value allowance, or nominal position.

24. The method in accordance with claim 2 or 4, characterized in that a correction of the lateral registration is made by means of the lateral registration/regulation device (342) via an actuating means (343), if the printed image as a whole differs from its nominal position in a lateral direction, a correction by means of the device (336) for affecting the fan-out effect is performed, if the evaluation provides the result that, although the nominal position has been assumed, a distortion or widening of the printed image exists.

25. The method in accordance with claim 2 or 4, characterized in that the evaluation and determination of the correction of the lateral registration and of the fan-out takes place by means of a common, or at least coupled, control algorithm.

26. The method in accordance with claim 2, 4, 19 or 24, characterized in that in case of a deviation of the lateral registration, as well as the fan-out, from the respective preset nominal values, the determination of the two corrections is provided cyclically.

27. The method in accordance with claim 26, characterized in that the deviation of the lateral registration is determined in a first step, and thereafter the distance change between the measuring or image points because of the fan-out.

28. The method in accordance with claim 2 or 4, characterized in that in case of a deviation of the lateral registration, as well as the fan-out, the determination of the two corrections is performed by means of a common calculation algorithm by means of the at least two measured values, or image points.

29. A device (336) for affecting the fan-out effect, with a control device (339) and actuating means (338), and for affecting the lateral registration by means of a lateral register control/regulation device (342), characterized in that a common sensor (341), which detects a printed image over the entire web width (b, b'), a printed image portion, or a printed-on marker, is assigned to the device (336) for affecting the fan-out effect and to the lateral register control/regulation device (342).

30. The device in accordance with claim 29, characterized in that two sensors (341), arranged side-by-side in the axial direction, are assigned to the device (336) for affecting the fan-out effect, both of which are in a signal connection with a control (339) for affecting the lateral registration, and at least one is in a signal connection with the lateral registration control/regulation device (342).

31. The device in accordance with claim 29, characterized in that an image sensor (341) which detects the printed image over a significant scanning width (b341) of at least one-quarter of the web width (b, b'), is designed as the sensor (341).

32. The device in accordance with claim 31, characterized in that the sensor (341), or an evaluation unit evaluating the image material of the sensor (341), is in a signal connection with a control device (339) for affecting the lateral registration, as well as with the lateral registration control/regulation device (342).

33. The device in accordance with claim 30 or 32, characterized in that the control device (339) for affecting the lateral registration, and the lateral registration control/regulation device (342) are designed as hardware units, which are structurally separated from each other.

34. The device in accordance with claim 30 or 32, characterized in that the control device (339) for affecting the lateral registration, and the lateral registration control/regulation device (342) are designed as two calculation algorithms, which are different from, but are coupled with, each other.

35. The device in accordance with claim 30 or 32, characterized in that the control device (339) for affecting the lateral registration, and the lateral registration control/regulation device (342) are designed as sequentially running program modules of a common calculation algorithm.

36. The device in accordance with claim 29, characterized in that the actuating means (338) is embodied as a roller, which can be selectively brought into the plane of the running web (B, B').

37. The device in accordance with claim 29, characterized in that the actuating means (338) is embodied as a nozzle (338) for the exit of compressed air, wherein the force of the air flow and/or a distance of the support element (338) from the web (B, B') can be set by the control device (339).

38. The device in accordance with claim 29, characterized in that the actuating means (338) is designed as a support element (338) through which air flows, whose surface has micro-openings for forming an air cushion,

wherein a distance of the support element (338) from the web (B, B') can be set by the control device (339).

39. The method in accordance with claim 1, 2 or 4, or the device in accordance with claim 29, characterized in that an image sensor (341) is embodied as the sensor (341) which detects the printed image over a significant scanning width (b341) of at least half a web width (b, b').

40. The method in accordance with claim 1, 2 or 4, or the device in accordance with claim 29, characterized in that an image sensor (341) is embodied as the sensor (341) which detects the printed image over a significant scanning width (b341) of at least a whole web width (b, b').

41. The method in accordance with claim 1, 2 or 4, or the device in accordance with claim 29, characterized in that the sensor (341) is designed as a line camera.

42. The method in accordance with claim 1, 2 or 4, or the device in accordance with claim 29, characterized in that the sensor (341) is designed as a planar sensor (341), in particular as a camera.

43. The method in accordance with claim 5, or the device in accordance with claim 30, characterized in that the two axially spaced-apart sensors (341) are respectively designed as CCD chips, or have a CCD chip.